

Patent claims

- 1 1. Arrangement to monitor at least one parameter for a number of motor vehicle  
2 wheels, comprising:
  - 3 a) a number of detector units, each of which is assigned to a wheel, whereby  
4 each detector unit comprises a sensor for recording the at least one  
5 parameter and a transmit unit with a transmit antenna,
  - 6 b) at least one receive antenna comprising a directional characteristic  
7 positioned in such a way in the vehicle that, in connection with the field  
8 strengths of the signals sent by the individual transmit units at the location  
9 of the at least one receive antenna produces receive signals of different  
10 power in each case for at least two of the transmit units,
  - 11 c) a central evaluation unit which comprises a receive unit, wherein the  
12 receive unit is connected to the at least one receive antenna; and
  - 13 d) an evaluation unit coupled with the central evaluation unit which compares  
14 the receive power of a received signals with stored threshold values or  
15 ranges of values assigned to one wheel position in each case and assigns  
16 the received signal to a wheel position, if the threshold value assigned to  
17 this wheel position is exceeded or the receive power lies within the range  
18 of values assigned to this wheel position.
- 1 2. Arrangement in accordance with Claim 1, further comprising means for creating  
2 the directional characteristic of the at least one receive antenna such that, starting  
3 from the position of the receive antenna, they each produce sensitivities in the  
4 direction of the transmit antennas of the at least two signals to be distinguished  
5 of the relevant transmit units, for which the difference is greater than a  
6 predefined value, in which case this value is selected to enable a clear distinction  
7 to be made between the signals using the detected receive power of the two  
8 signals.

- 1 3. Arrangement in accordance with Claim 1, wherein for a vehicle with four  
2 wheels two receive antennas are provided.
- 1 4. Arrangement in accordance with Claim 3, wherein one receive antenna is  
2 provided in a position in the area of the front wheel and one receive antenna is  
3 provided in a position in the area of the rear wheel, preferably in the area above  
4 the wheel arch.
- 1 5. Arrangement in accordance with Claim 4, wherein the directional characteristic  
2 of the receive antenna at least in the direction of the further wheel of the same  
3 lengthwise side of the vehicle shows a low or high sensitivity and in the  
4 direction of the further front or rear wheel a high or low sensitivity, so that the  
5 evaluation unit can use one receive antenna in each case to undertake at least one  
6 unique assignment of the signals of the transmit units at the wheel positions in  
7 the direction of the low and high sensitivity.
- 1 6. Arrangement in accordance with Claim 5, wherein the directional characteristic  
2 of the receive antennas is created so that the signal of the transmit unit in the  
3 area of the same wheel creates the highest receive power in each case, which is  
4 clearly distinguishably higher than the receive power on reception of a signal  
5 from the transmit unit in the direction of the high sensitivity of the directional  
6 characteristic.
- 1 7. Arrangement in accordance with Claim 1, wherein the transmit antennas or the  
2 entire transmit units or detector units are identical in design.
- 1 8. Arrangement in accordance with Claim 1, wherein in the receive unit there is  
2 provision for a further receive antenna and wherein the receive unit is positioned  
3 adjacent to a transmit unit in such a way that this receive antenna receives the  
4 signal of the adjacent transmit unit with the greatest signal power.

- 1 9. Arrangement in accordance with Claim 1, wherein the evaluation unit comprises  
2 means for undertaking the assignment of the signals to wheel positions on  
3 request or at regular intervals as part of an assignment mode and when doing so  
4 assigns a characteristic identifier for the detected wheel position transmitted by  
5 one of the transmit units in each case and stores it and wherein the means in  
6 normal operation assign the received signals to the wheel positions using a  
7 comparison between the identifier transmitted by the transmit units and the  
8 stored assignment information (identifier for wheel position).
- 1 10. Arrangement in accordance with Claim 1, wherein the receive unit comprises a  
2 controllable switch that in each case connects one of a number of receive  
3 antennas with downstream components of receive unit.

- 1 11. Method for monitoring at least one parameter for a number of motor vehicle  
2 wheels, comprising the steps of :
- 3 a) recording the at least one parameter;
- 4 b) transmitting the at least one parameter with a transmit antenna, positioned  
5 at least one receive antenna in such a way in the vehicle that, in connection  
6 with the field strengths of the signals sent by the individual transmit units  
7 at the location of the at least one receive antenna produces receive signals  
8 of different power in each case for at least two of the transmit units; and
- 9 c) comparing the receive power of a received signals with stored threshold  
10 values or ranges of values assigned to one wheel position in each case and  
11 assigning the received signal to a wheel position, if the threshold value  
12 assigned to this wheel position is exceeded or the receive power lies within  
13 the range of values assigned to this wheel position.
- 1 12. The method in accordance with Claim 11, further comprising the steps of:  
2 starting from the position of the receive antenna, distinguishing at least two  
3 signals of the relevant transmit units by producing sensitivities in the direction of  
4 each of the transmit antennas, for which the difference is greater than a  
5 predefined value, in which case this value is selected to enable a clear distinction  
6 to be made between the signals using the detected receive power of the two  
7 signals.
- 1 13. The method in accordance with Claim 12, further comprising the step of  
2 providing one receive antenna in a position in the area of a front wheel and one  
3 receive antenna in a position in the area of a rear wheel, preferably in the area  
4 above the wheel arch.

- 1 14. The method in accordance with Claim 13, wherein the directional characteristic  
2 of the receive antenna at least in the direction of the further wheel of the same  
3 lengthwise side of the vehicle shows a low or high sensitivity and in the  
4 direction of the further front or rear wheel a high or low sensitivity, so that the  
5 evaluation unit can use one receive antenna in each case to undertake at least one  
6 unique assignment of the signals of the transmit units at the wheel positions in  
7 the direction of the low and high sensitivity.
- 1 15. The method in accordance with Claim 14, further comprising the step of creating  
2 the directional characteristic of the receive antennas in such a way that the signal  
3 of the transmit unit in the area of the same wheel creates the highest receive  
4 power in each case, which is clearly distinguishably higher than the receive  
5 power on reception of a signal from the transmit unit in the direction of the high  
6 sensitivity of the directional characteristic.
- 1 16. The method in accordance with Claim 11, further comprising the steps of:  
2 providing for a further receive antenna in the receive unit and positioning the  
3 receive unit adjacent to a transmit unit in such a way that this receive antenna  
4 receives the signal of the adjacent transmit unit with the greatest signal power.
- 1 17. The method in accordance with Claim 11, wherein the evaluation unit  
2 undertakes the assignment of the signals to wheel positions on request or at  
3 regular intervals as part of an assignment mode and when doing so assigns a  
4 characteristic identifier for the detected wheel position transmitted by one of the  
5 transmit units in each case and stores it and the evaluation unit in normal  
6 operation assigns the received signals to the wheel positions using a comparison  
7 between the identifier transmitted by the transmit units and the stored  
8 assignment information (identifier for wheel position).

- 1 18. The method in accordance with Claim 11, further comprising the step of
- 2 connecting one of a number of receive antennas with downstream components
- 3 of the receive unit by means of a switch.